

WHAT IS CLAIMED IS:

1. A motor driving apparatus for driving a motor, comprising:
 - a rectifier circuit having an input connected to a single-phase AC power supply;
 - an inverter circuit which is connected to the rectifier circuit, and outputs a current and a voltage to the motor;
 - an inverter control unit for controlling the inverter circuit so as to drive the motor; and
 - said inverter control unit including a power supply voltage estimation unit for estimating a voltage of the single-phase AC power supply, and changing the value of the current or voltage outputted from the inverter circuit, according to the power supply voltage estimated by the power supply voltage estimation unit.
2. A motor driving apparatus as defined in Claim 1 wherein
 - said inverter control unit performs at least one of a first control and a second control, said first control is to decrease the value of the output current or output voltage of the inverter circuit when the power supply voltage estimated by the power supply voltage estimation unit is changing from a zero voltage to a peak voltage, and said second control is to increase the value of the output current or output voltage of the inverter circuit when the power supply voltage estimated by the power supply voltage estimation unit is changing from the peak voltage to the

zero voltage.

3. A motor driving apparatus as defined in Claim 1 wherein
said power supply voltage estimation unit has a zerocross
detection unit for detecting a zerocross timing of the single-
phase AC power supply, and estimates a voltage of the single-
phase AC power supply from the zerocross timing detected by the
zerocross detection unit.
4. A motor driving apparatus as defined in Claim 1 wherein
said inverter control unit has an inverter input voltage
detection unit for detecting the voltage inputted to the inverter
circuit, compares the absolute value of the power supply voltage
estimated by the power supply voltage estimation unit with the
inverter input voltage detected by the inverter input voltage
detection unit, and performs at least one of a first control and
a second control, said first control is to increase the value of
the output current or output voltage of the inverter circuit when
the inverter input voltage is higher than the absolute value of
the estimated power supply voltage, and said second control is to
decrease the value of the output current or output voltage of the
inverter circuit when the inverter input voltage is lower than
the absolute value of the estimated power supply voltage.
5. A motor driving apparatus as defined in Claim 4 wherein

said motor is a DC brushless motor,

said first control is to advance the phase of the output current or output voltage of the inverter circuit when the inverter input voltage is higher than the absolute value of the estimated power supply voltage, and

said second control is to delay the phase of the output current or output voltage of the inverter circuit when the inverter input voltage is lower than the absolute value of the estimated power supply voltage.

6. A motor driving apparatus as defined in Claim 4 wherein

said motor is an induction motor,

said first control is to decrease the angular velocity of the output current or output voltage of the inverter circuit when the inverter input voltage is higher than the absolute value of the estimated power supply voltage, and

said second control is to increase the angular velocity of the output current or output voltage of the inverter circuit when the inverter input voltage is lower than the absolute value of the estimated power supply voltage.

7. A motor driving apparatus as defined in Claim 4 wherein

said power supply voltage estimation unit includes a timing detection unit for detecting a timing at which the inverter input voltage attains a maximum value, on the basis of the inverter

input voltage detected by the inverter input voltage detection unit, and estimates a voltage of the single-phase AC power supply on the basis of the timing detected by the timing detection unit, and the inverter input voltage value that is an output from the inverter input voltage detection unit at this timing.

8. A motor driving apparatus as defined in Claim 1 wherein said rectifier circuit has a capacitor for charging a regenerative current from the motor.

9. A motor driving apparatus as defined in Claim 1 wherein said rectifier circuit has an inductor for cutting noise that occurs in the inverter circuit.

10. A compressor including a motor for generating a power, and a motor driving apparatus for driving the motor, and

said motor driving apparatus being a motor driving apparatus as defined in Claim 1.

11. An air conditioner including a compressor having a motor for generating a power, and a motor driving apparatus for driving the motor of the compressor, and

said motor driving apparatus being a motor driving apparatus as defined in Claim 1.

12. A refrigerator including a compressor having a motor for generating a power, and a motor driving apparatus for driving the motor of the compressor, and

said motor driving apparatus being a motor driving apparatus as defined in Claim 1.

13. An electric washing machine including a motor for generating a power, and a motor driving apparatus for driving the motor, and

said motor driving apparatus being a motor driving apparatus as defined in Claim 1.

14. An air blower including a motor for generating a power, and a motor driving apparatus for driving the motor, and

said motor driving apparatus being a motor driving apparatus as defined in Claim 1.

15. An electric vacuum cleaner including a motor for generating a power, and a motor driving apparatus for driving the motor, and

said motor driving apparatus being a motor driving apparatus as defined in Claim 1.

16. An electric dryer including a compressor having a motor for generating a power, and a motor driving apparatus for driving the motor of the compressor, and

said motor driving apparatus being a motor driving apparatus

as defined in Claim 1.

17. A heat pump type hot-water supply unit including a compressor having a motor for generating a power, and a motor driving apparatus for driving the motor of the compressor, and said motor driving apparatus being a motor driving apparatus as defined in Claim 1.